

## CONGENITAL MENINGOCELE & HYDROCEPHALUS, WHEN TO OPERATE IN ONE OR TWO SESSIONS

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### ABSTRACT

#### Aim

*To know what cases operated upon in one session rather than two sessions for neonates with congenital meningocele associated with hydrocephalus.*

#### Background

*A meningomyelocele is common birth defect (0.2-2/1000 live births), defined as 'a hernial protrusion of a part of the meninges and substance of the spinal cord through a defect in the vertebral column' with or without neurological deficit, and 15-25% of neonates with myelomeningocele have hydrocephalus at birth. about 80-90% of them need shunt procedure. meningocele repair and vp shunt placement done in one or two session .*

#### Object

*To compare the result of surgery and complications of meningocele repair and vp shunt placement when done in one or two session .which is best.*

#### Materials and Methods

*This is a comparative prospective study of 30 patients with congenital meningocele and hydrocephalus whatever their presenting status having their defects corrected by surgery, these patients divided into two groups; group one; have their meningocele repair and vp shunt placement done in one session (15 patients). group two; have done in two sessions (15 patients). These patients were selected randomly. We observed and analysed the presenting features , age and complications for these infants underwent surgeries in one and two sessions to know what criteria drive our decision to operate in one or two sessions.*

#### Results

*We find 10 neonates from one session group operated between days 1-5 while no neonates from two sessions group. and 3 neonates from one session group operated from days 6-10 while 2 neonates from two sessions group. and 3 patients from two sessions group operated up to one year while no patient in one session group. Only two of one session group move their lower limbs versus 10 patients in two sessions group. Eleven out of 15 have ruptured meningocele in one session group versus 4 out of 15 in two sessions group have ruptured meningocele. Seven neonates from one session group were underweight versus 2 from two sessions group. Two neonates from one session group stayed for 3-5 days versus 8 neonates from two sessions group. Five neonates from one session group stayed for 11-15 days versus 3 neonates from two sessions group. CSF leak & wound dehiscence, Chest infection, Wound infection, Jaundice, Poor feeding & Death due to septicemia more occur in neonates of one session group versus neonates of two sessions group. Moreover, primary neurosurgical repair of meningocele within the first 72 hours after delivery provides an improved neurogenic bladder/bowel prognosis*

**Conclusions**

*Children who are having meningocele and hydrocephalus can be operated either by one stage procedure or two stage procedure, depending on clinical presentation regarding severity of hydrocephalus & whether meningocele is ruptured or intact. children with one session surgery always have clinically evident hydrocephalus whether meningocele is intact or ruptured with their clinical condition permit longer duration anesthesia, on the other hand children who were operated in two sessions either their hydrocephalus is not severe or have delayed presentation or have advanced hydrocephalus but with intact meningocele with sometime critical clinical condition not permitting long anesthesia.*

**KEYWORDS:** *Meningocele, Hydrocephalus & Session Surgery*

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**INTRODUCTION**

A meningomyelocele is defined as 'a hernial protrusion of a part of the meninges and the substance of the spinal cord through a defect in the vertebral column'. This, however, appears to be an over-simplification, since in most cases the lesion of the spinal cord is more than a simple herniation into a sac. The initial malformation in all cases of 'meningomyelocele' was an open myelocele which tended to be covered in time by an epithelialized scar (DORLAND DICTIONARY 1965).

According to Cameron & Willis neural tube defect & spina bifida are classified as follow

- Spina bifida occulta, where the cord remains inside the canal.
- Meningocele, where a cystic swelling is formed by dura and arachnoid and the cord remains in the canal.
- Meningomyelocele, where the cord is closely applied to the fundus of a cystic swelling.
- Myelocele, where part of the spinal cord is exposed to the surface.

The presence or absence of involvement of the cord and the roots constituted the basis of the anatomical lesion, the neurological deficit, and the nature of any surgical intervention.

The incidence of meningocele is 0.2-2/1000 live births, and 15-25% of neonates with myelomeningocele have hydrocephalus at birth. Hence required significant amount of medical intervention, about 80-90% of them need shunt procedure.

Hydrocephalus in infants manifested as large head, sunset eyes, tense fontanelles and prominent scalp vascular markings and it is due to raised intracranial pressure caused by disequilibrium between CSF production and absorption associated with dilated ventricles(1).

**MATERIAL & METHODS**

This is a comparative prospective study of 30 patients with congenital meningocele and hydrocephalus whatever their presenting status having their defects corrected by surgery, these patients divided into two groups;

- Group one; have their meningocele repair and vp shunt placement done in one session.
- Group two; have their meningocele repair and vp shunt placement done in two sessions.

These patients were selected randomly.

We observed and analysed the presenting features, age and complications for these infants underwent surgeries in one and two sessions to know what criteria drive our decision to operate in one or two sessions.

### Inclusion Criteria

Any neonate or infant have congenital meningocele and hydrocephalus underwent surgery whether in one or two sessions, and whether meningocele is ruptured or not and whether hydrocephalus is evident clinically or radiologically, and this is can be managed by placement of vp shunt.

Repair of meningocele and placement of vp shunt can be done either in one session or two sessions, however many controversies are present regarding timing of vp shunt placement, on other hand there is a considerable evidence support repair of meningocele as soon as possible to avoid complications like meningitis, ventriculitis is especially when repair delayed more than 36 hrs after birth(7).

This is a comparative study between two groups having surgical repair of their congenital meningocele & hydrocephalus operated by different surgeons

Group one have operations in one session including 15 patients

Group two(control) have operation in two sessions also 15 patients

These patients are selected in arandomized manner and analysed regarding their mode of delivery, birth weight, head size, age at surgery, clinical presentation, site of defect, operative time, post-operative condition, average hospital stay, complication and outcome.

Table-1 Show distribution of patients according to age

We find 10 patients in one session group operated from day 1 to 5 while in two session group 7 patients.

3 patient in one session group operated in days 6 to 10 days while 5 patients in two session group.

2 patient in one session group operated in days 10-30 while 3 patients in two session group.

**Table 1**

Age Distribution for Meningocele Surgery in Days	One Session Group	Two Session Group
1-5	10	7
6-10	3	5
11-30	2	3
total	15	15

Table-2 shows age distribution for shunt surgery

10 neonates from one session group operated between days 1-5 while no neonates from two session group.

3 neonates from one session group operated from days 6-10 while 2 neonates from two session group.

2 neonates in one session group operated from days 10-3- while 10 neonates in two session group.

3 patients from two session group operated up to one year while no patient in one session group.

**Table 2**

Age Distribution for Shunt Surgery	One Session Group	Two Sessions Group
1-5 days	10	0
6-10 days	3	2
10-30 days	2	10
Up to one year	0	3

Table-3 shows the distribution according to gender

9 males and 6 females in one session group, 10 males and 5 females in two session group.

**Table 3**

Distribution According to Gender	One Session Group	Two Session Group
Male	9	10
Female	6	5

Table-4 Shows the distribution according to clinical presentation

Those with one session no one present with normal head while those with two session 13 patients have normal head size at time of meningocele surgery.

Only two of one session group move their lower limbs versus 10 patients in two session group.

Eight are paraplegic & five have one or both weak limbs in one session group versus 2 paraplegic & three with weak one or both lower limbs in two session group.

Eleven out of 15 have ruptured meningocele in one session group versus 4 out of 15 in two session group have ruptured meningocele.

**Table 4**

Distribution According to Clinical Presentation at Time of Surgery of Meningocele	One Session Group	Two Session Group
Normal head size	0	13
Large head size	15	2
Moving lower limbs	2	10
paraplegic	8	2
Weak one or both lower limbs	5	3
Ruptured meningocele	11	4
<b>Total</b>	<b>15</b>	<b>15</b>

Table-5 Shows the distribution according to average time of surgery

Two neonates from one session group their operation time last from 90-100 min.

8 neonates from one session group their operation last from 101-120 min. versus 2 neonates from two session group.

Five neonates from one session group their operation last 121-140 min. versus 8 neonates from two session group.

Five neonates from two session group their operation last from 141-150 min. this is from total of 15 neonates in each group.

**Table 5**

<b>Average Time of Surgery</b>	<b>One Session Group</b>	<b>Two Session Group</b>
90-100 min	2	0
101-120	8	2
121-140 min	5	8
141-150 min	0	5
<b>Total</b>	<b>15</b>	<b>15</b>

Table-6 Distribution according to site of meningocele defect

Eight neonates from one session group their meningocele located in the lumbar region versus 10 neonates from two session group.

Seven neonates from one session group their meningocele located in the dorsal region versus 5 neonates from two session group.

This is from total of 15 neonates in each group.

**Table 6**

<b>Distribution According to Site of Meningocele Defect</b>	<b>One Session Group</b>	<b>Two Session Group</b>
lumbar	8	10
dorsal	7	5
<b>Total</b>	<b>15</b>	<b>15</b>

Table-7 Shows the distribution according to birth weight

Seven neonates from one session group were underweight versus 2 from two session group.

Eight neonates from one session group have normal weight versus 11 neonates from two session group.

Only 2 neonates from two session group were overweight, from total of 15 neonates for each group.

**Table 7**

<b>Distribution According to Birth Weight</b>	<b>One Session Group</b>	<b>Two Session Group</b>
Under weight	7	2
Normal weight	8	11
Over weight		2
<b>Total</b>	<b>15</b>	<b>15</b>

Table-8 Shows the distribution according to average hospital stay

Tow neonates from one session group stayed for 3-5 days versus 8 neonates from two session group.

Eight neonates from one session group stayed for 6-10 vrsus 4 neonates from 2 session group.

Five neonates from one session group stayed for 11-15 days versus 3 neonates from 2 session group.

**Table 8**

Average Hospital Stay	One Session Group	Two Session Group
3-5 days	2	8
6-10 days	8	4
11-15 days	5	3

Table-9 shows the distribution according to post-operative complications

CSF leak & wound dehiscence occur in 2 neonates of one session group versus no neonates of 2 session group.

Chest infection occur in 8 neonates of one session group versus 5 neonates of 2 session group.

Wound infection occur in 2 neonates of one session group versus 1 neonate of 2 session group.

Jaundice occur in 8 neonates of one session group versus 3 neonates of 2 session group.

Poor feeding occur in 5 neonates of one session group versus 2 neonates of 2 session group.

Death due to septicemia occur in 2 neonates of one session group versus no neonate in 2 session group.

**Table 9**

Post-Operative Complications	One Session Group	Two Session Group
Csf leak & wound dehiscence	2	0
Chest infection	8	5
Wound infection	2	1
jaundice	8	3
Poor feeding	5	2
Death due to septicemia	2	0

Table-10 Distribution according to mode of delivery

All neonates from one session group were delivered by cesarian section while 6 neonates from two session group were delivered by cesarian section and 9 were delivered by normal vaginal delivery, this is from total of 15 in each group.

**Table 10**

Distribution According to Mode of Delivery	One Session Group	Two Session Group
Cessarian section	15	6
Normal vaginal delivery	0	9
<b>Total</b>	<b>15</b>	<b>15</b>

## DISCUSSIONS

Hydrocephalus occurs in 60-90% of patients born with associated meningocele & manifested as increase head size, sunset eyes, bulging fontanels & prominent scalp vessel, it is due to raised intracranial pressure and often associated with dilated ventricles.<sup>1</sup>

In most cases the severity of hydrocephalus increases after the surgical repair of meningocele indicating placement of vp shunt.

Very few neonates with meningomyelocele exhibit overt signs of hydrocephalus at birth and it is a common practice to limit the initial procedure to closure of the meningomyelocele and to place a shunt only if overt hydrocephalus develops.

Our study compares two groups of neonates operated for repair of meningocele and placement of vp shunt, group one have their operation done in one session and group two have their operation done separately(two sessions), each group include fifteen patients.

Neural tube defects are among the most common types of birth defect.<sup>46</sup>

The main problem is a congenitally dysraphic vertebra with herniation of the meninges with the cord either remained entirely inside the canal and in this case we call it meningocele or the cord herniated partially or completely outside and we call it myelomeningocele, in either cases the defect will be opened or covered either by skin or by agliotic tissue called plaqued.<sup>2,3</sup>

In neonates with overt hydrocephalus at birth, ventricular shunting decreases the risk of further braindamage.<sup>47</sup>

It is a common practice to limit the initial procedure to closure of the meningomyelocele and to place a shunt only if overt hydrocephalus develops.

Lorber et al<sup>49</sup> (1961) reported 89% needing shunt in their study group.

Depending on clinical signs like measurement of head circumference, palpation looking for bulging anterior fontanel, increase vascular marking in the evaluation of hydrocephalus in the newborn may be misleading.

William O. Bell et al<sup>48</sup> postulated that shunt placement may be avoidable in some instance when more exacting criteria for ventriculomegaly on computed tomographic scans or ultrasound have been established.

There is considerable controversy as to optimal timing of operation for meningomyelocele repair. Although some authors claim that there is no difference in outcome between early and delayed closure of a meningomyelocele, there is considerable evidence that myelomeningocele should be repaired early because delay increase the risk of infection.

Early repair of meningocele also decrease incidence of shunt infection and malfunction from the increase csf protein and debris.

Moreover, primary neurosurgical repair of meningocele within the first 72hours after delivery provides an improved neurogenic bladder/bowel prognosis.<sup>52</sup>

## **CONCLUSIONS**

Children who are having meningocele and hydrocephalus can be operated either by one stage procedure or two stage procedure, depending on clinical presentation regarding severity of hydrocephalus & whether meningocele is ruptured or intact. children with one session surgery always have clinically evident hydrocephalus whether meningocele is intact or ruptured with their clinical condition permit longer duration anesthesia, on the other hand children who were operated in two sessions either their hydrocephalus is not severe or have delayed presentation or have advanced hydrocephalus but with intact meningocele with sometime critical clinical condition not permitting long anesthesia.

## **RECOMMENDATIONS**

Correct any defect as soon as possible as the general condition of the patient permit from anesthetic point of view in one session to gain time and avoid risk of subjecting the patient to two time of anesthesia and two admissions to hospital

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